



As the Navy's pre-eminent laboratory for integrated command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) solutions, Naval Information Warfare Center Pacific (NIWC Pacific) is committed to delivering enhanced capabilities for U.S. Navy information warfare.

To assure the Navy's continued advantage in the space domain—and thereby provide a solid foundation for achieving dominance in information warfare—NIWC Pacific provides innovative capabilities for U.S. Navy operations in space, both by maximizing existing systems and by developing emerging technologies.

### NIWC Pacific Unique Space Capabilities

Space systems provide crucial capabilities in the areas of intelligence, surveillance, and reconnaissance (ISR), missile warning, environmental monitoring, satellite communications, and position, navigation, and timing (PNT). Together, these capabilities underpin the United States' key military advantage—the ability to create a picture of the operating environment, then use that picture to dominate the battlespace in all domains.

NIWC Pacific provides unique capabilities in the following areas:

- Satellite communications
- Global PNT systems
- Ground support system engineering
- Space command and control

In addition to supporting major space programs of record, NIWC Pacific is focused on developing space systems that assure their relevance in the future battlefield by incorporating dynamic constellations of heterogeneous, adaptive, and reconfigurable platforms of various sizes and capabilities, all able to operate in denied or degraded environments.



Nanosatellite



Site acceptance test



## Some of NIWC Pacific's current Space efforts

Mobile user objective system (MUOS): MUOS is a military satellite communications (MILSATCOM) system that supports a worldwide, multiservice population of users in the ultra-high frequency (UHF) band. The MUOS system provides increased communications capabilities to newer generations of tactical radios through wideband code division multiple access cellular technology, while still providing interoperability with legacy UHF terminals.

- **Integrated communications extension capability (ICE-Cap):** ICE-Cap will launch a low-earth orbiting nanosatellite with a communications "cross-link" to the MUOS satellites in geosynchronous orbit.
- **Protected tactical enterprise service (PTES):** NIWC Pacific provides continuous engineering oversight and supporting of PTES program to identify, assess, and mitigate engineering risk; focus on defining technical requirements; and help ensure program success. PTES provides protected tactical waveform (PTW)-based communications to warfighters over wideband global SATCOM (WGS) X- and Ka-bands with robust planning and management systems. PTW provides cost-effective, protected communications over both military and commercial satellites in multiple frequency bands as well as broader protection, more resiliency, more throughput and more efficient utilization of satellite bandwidth.
- **Global positioning and navigation systems (GPNS):** GPNS tasking primarily involves the NAVSTAR global positioning system, a space-based radio navigation system that provides position, velocity, and time, both globally and continually. NIWC Pacific engineers and scientists provide system engineering, and in-service engineering support, primarily to the Navigation Systems Program at Program Executive Office (PEO) C4I (PMW/A170) and the GPS Directorate in Los Angeles, as well as conduct basic and applied research supporting development and/or test of new and/or future capabilities.
- **Joint MILSATCOM network integrated (JMINI) control system:** An acquisition category IV test program of record, JMINI provides centralized control and access for all Department of Defense (DoD) ultra high frequency demand multiple access and demand assigned single access satellite channels worldwide, as well as remote communications planning and management of UHF satellite channels. This removes the "air gap" between the communications planner and the control sites.
- **Enterprise space battle management command and control (ESBMC2):** A program in early development, ESBMC2 builds on the space situational awareness capabilities of joint mission systems and incorporates support to the mission of the National Space Defense Center. ESBMC2 capabilities will provide deliberate and crisis action planning products and decision support tools to enable timely and accurate execution of authorities from the operational echelon of command, bridging the gap from strategic to tactical. Our engineers are currently

engaged in leading key technology maturation through interface with the related joint emergent operational needs efforts as well as ESBMC2 prototyping.

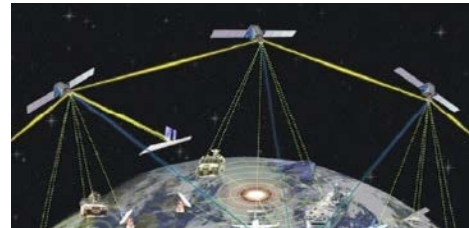
We are leading program planning as well as enterprise space governance development aimed at aligning three major Air Force efforts, related National Reconnaissance Office efforts, and other supportive programmatic activities in the DoD and intelligence community that share common objectives. These objectives will be enabled by systems engineering including enterprise requirements management, agile and continuous integration, standards and open architecture, and cyber resilience.

## With the Warfighter

- **Joint space operations center (JSpOC) mission systems (JMS):** An acquisition category I program providing command and control (C2) capabilities for space and replaces multiple legacy systems with sustainable hardware and open, evolvable software architecture.

JMS is an integrated, net-centric space situational awareness and C2 capability that rapidly detects, tracks, and characterizes objects of interest, identifies/exploits traditional and non-traditional sources, performs space threat analysis, and conducts C2 of space forces in dynamic environments. Throughout the development and validation cycles, our engineers and scientists interact with the JSpOC mission personnel at Vandenberg Air Force Base to validate system requirements, system usability, and operational assessment prior to new capability cutover.

Once fielded, NIWC Pacific will support the sustainment of JMS and provide user support in future integration efforts with other netcentric space sensor and C2 capabilities.



Battlespace awareness



JMS user screen



JSpOC watch floor

### For more information

#### Space

Joe Summa

[joe.summa@navy.mil](mailto:joe.summa@navy.mil)

(619) 553-7132

Jim Reed

[james.n.reed@navy.mil](mailto:james.n.reed@navy.mil)

(619) 553-4553

Bryan Tollefson

[bryan.tollefson@navy.mil](mailto:bryan.tollefson@navy.mil)

(619) 553-7634

Naval Information Warfare Center Pacific (NIWC Pacific)

53560 Hull Street San Diego, California 92152-5001

Public Affairs Office: (619) 553-2717

[www.public.navy.mil/navwar/NIWC-Pacific](http://www.public.navy.mil/navwar/NIWC-Pacific)